

# Environmental Health Data Needs for Identifying Environmentally Burdened Communities

**Debbie Lowe, EJ Program, US EPA, Region 9**

**[lowe.debbie@epa.gov](mailto:lowe.debbie@epa.gov)**

**415-947-4155**

Rachel Morello-Frosch Brown University

Manuel Pastor UC Santa Cruz

James Sadd, Occidental College

Paul English, CA EH Tracking Program

Matthew Lakin, US EPA, Region 9

Tim Watkins, US EPA, ORD



# Outline

- Guidance/Policy
  - EPA's Framework for Cumulative Risk
  - NEJAC: Ensuring Risk Reduction in Communities with Multiple Stressors: Environmental Justice and Cumulative Risks/Impacts
  - Cumulative Impacts in California EJ Action Plan
- EPA Environmental Justice Analyses
  - EJ Targeting
  - EJ Assessment
- RARE Research Project on Vulnerability

# Cumulative Risk/Impacts

- EPA's Framework for Cumulative Risk Assessment (May 2003)
  - the first step in a long-term effort to develop cumulative risk assessment guidance
- NEJAC: Ensuring Risk Reduction in Communities with Multiple Stressors: Environmental Justice and Cumulative Risk/Impacts (December 2004)

<http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=54944>

<http://www.epa.gov/compliance/resources/publications/ej/nejac/nejac-cum-risk-rpt-122104.pdf>

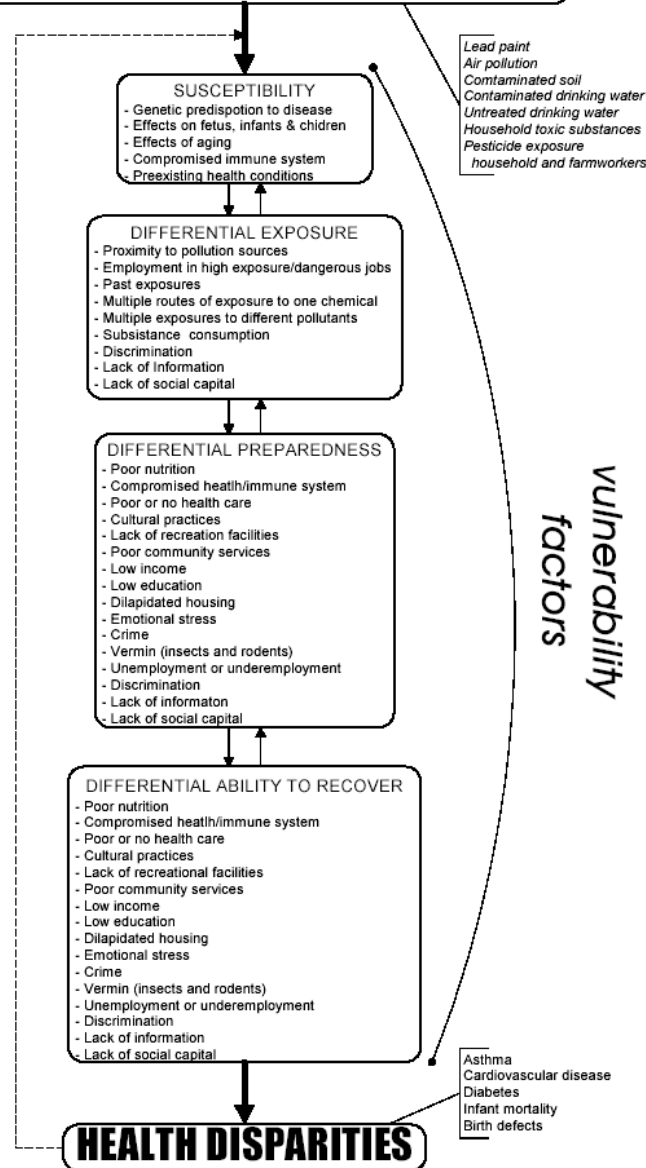
# NEJAC Report: Overarching Themes

- To fully incorporate the concept of vulnerability, especially its social and cultural aspects, into EPA's strategic plans and research agendas
- To promote a paradigm shift to community-based approaches, particularly community-based participatory research and intervention
- To incorporate social, economic, cultural and community health factors, particularly those involving vulnerability, in EPA decision-making
- To develop and implement efficient screening, targeting, and prioritization methods/tools to identify communities needing immediate intervention

# NEJAC -- Vulnerability

- Disadvantaged communities have pre-existing deficits of both a physical and social nature that make the effects of environmental pollution more burdensome
- Susceptibility/Sensitivity
  - Pre-existing health conditions, compromised immune system
  - Community with large # asthmatics more susceptible to air pollution
- Differential Exposure
  - Proximity to pollution sources, subsistence consumption, lack of information
- Differential Preparedness
  - Poor nutrition, dilapidated housing, poor community services, emotional stress, lack of information
- Differential Ability to Recover
  - Lack of access to health care, poor nutrition, lack of social capital, cultural practices

## Exposure to Environmental Hazards



**Figure 7:** This graphic was developed by the NEJAC Work Group to illustrate the relationship between environmental hazards, vulnerability, and health disparities, and how health disparities are both an outcome of and a contributor to vulnerability.

# Cumulative Impacts in California

"Cumulative impacts means exposures, public health or environmental effects from the combined emissions and discharges, in a geographic area, including environmental pollution from all sources, whether single or multi-media, routinely, accidentally, or otherwise released. Impacts will take into account **sensitive populations and socio-economic factors**, where applicable and to the extent data are available."

CAL EPA Environmental Justice Action Plan, working definition  
<http://www.calepa.ca.gov/EnvJustice/ActionPlan/>

# EJ Analysis at EPA

## ➤ EJ Targeting

Screening/prioritization – Are there environmentally overburdened communities where EPA should focus risk reduction activities?

## ➤ EJ Assessment

Response – When a community claims environmental injustice, how does EPA evaluate this?



# Environmental Justice Smart Enforcement Assessment Tool (EJSEAT)

- National tool, currently in development  
Purpose: identify, in a more consistent and analytically rigorous manner, areas that may be disproportionately and adversely affected by environmental effects to assist EPA to make fair and efficient resource deployment decisions
- Uses indicators in 4 categories
  - Demographics
  - Environmental
  - Compliance
  - Health

# EJSEAT Health Indicators

- County-level low birth weight and infant mortality
- County level data too geographically large, especially in the West
  - Most other data at census tract level
- Need asthma data
  - Consistent data nationwide needed
  - In California, asthma hospitalizations may not be the best measure
- Lack good indicators for evaluating vulnerability

# Environmental Justice Assessments

- EPA Guidance
  - Toolkit for Assessing Potential Allegations of Environmental Injustice (Nov 2004)
- To better understand the community's economic, social, environmental, and health level status or well-being.
- Focus data collection/analysis on concerns of community
- Compares environmental and health data in affected community with benchmark values and/or reference groups (County or State)

<http://www.epa.gov/compliance/resources/policies/ej/ej-toolkit.pdf>

# Data Used in R9 EJ Assessments

## Demographics

- % minority

- % poverty

- language

- educational attainment

## EPA regulated facilities (density)

- TRI

- CERCLA (Superfund)

- RCRA

## Environmental compliance

- ECHO

## Air quality

- RSEI

- NATA

- AQI

## Water quality

- drinking water quality

- impaired water bodies

## Pesticide use (in California)

## Spills or accidents

- National Response Center

- Risk Management Plans

## Community health

- MUA, HPSA

- asthma hospitalization rates

- low birth weight

- infant mortality rate

- elevated blood lead

- cancer

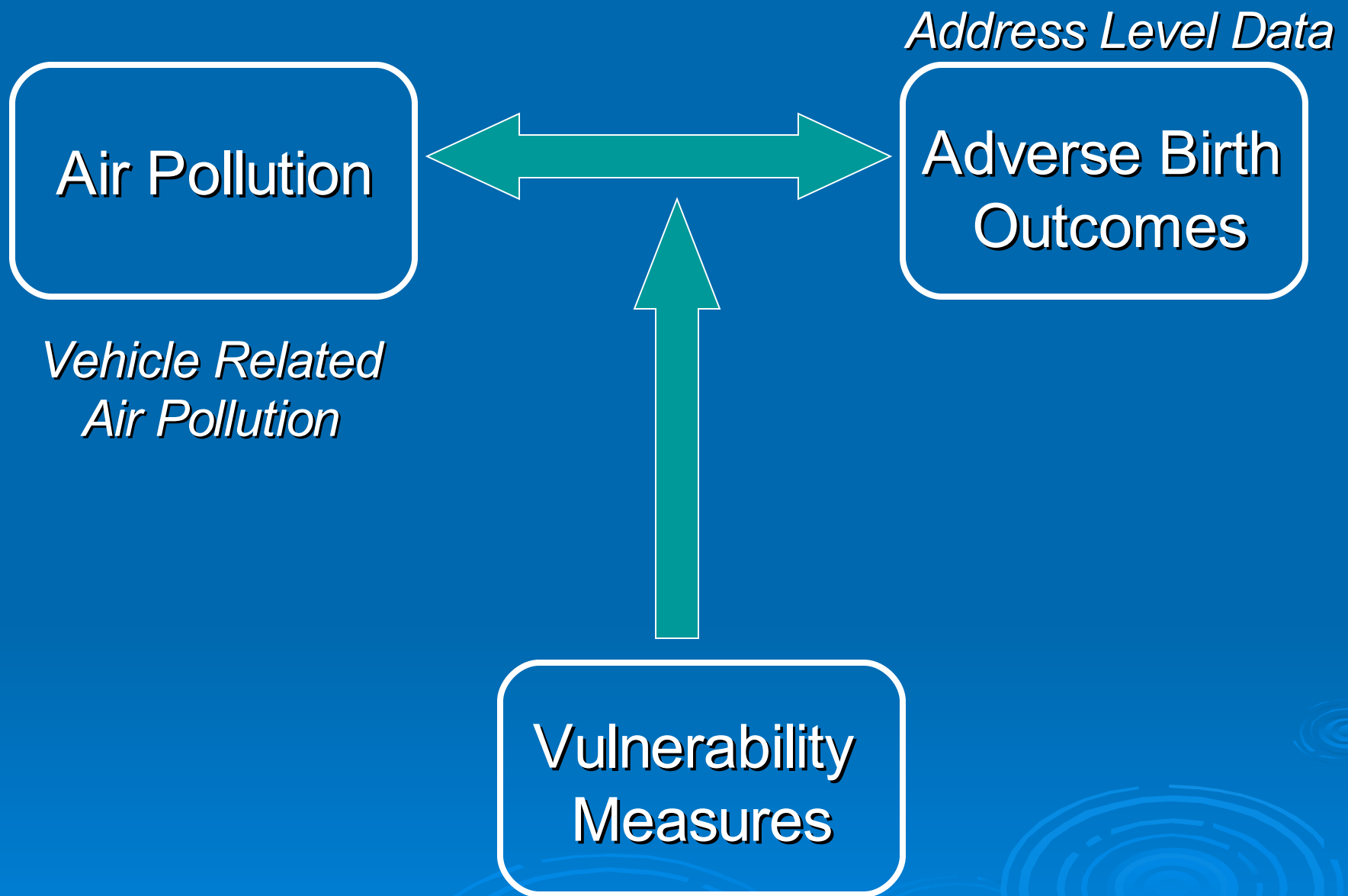
- birth defects

# Region 9 RARE Project

- Regional Applied Research Effort (RARE)
  - ORD funded
- Supports short-term regional science priorities
- Regional competition
- Projects should support region's science priorities and strategic plan

# R9 RARE Project on Vulnerability

- Builds on existing project: **Air Pollution and Environmental Justice: Integrating Indicators of Cumulative Impact and Socioeconomic Vulnerability into Regulatory Decision-making**
  - UCSC, Brown, Occidental and California Air Resources Board
- Adds vehicle-related air pollution
- Add address level birth outcome data



## ***SES and Race/Ethnicity***

|                         |   |
|-------------------------|---|
| Population Density      | Persons per unit area   |
| Race/Ethnicity          | Proportion of each racial/ethnic group residing in a census tract.  |
| Homeownership           | Proportion of housing units in a census tract owned by people who are living in them  |
| Median Property Value   | Median property value (housing) in a tract  |
| Median Household Income | Median income for a household in a census tract   |
| Townsend Index          | A census tract-level measure of area deprivation which considers unemployment, car ownership, crowding, and home ownership. |
| Poverty                 | Proportion of residents in a tract living below the federally – defined poverty line.                                       |



## ***Community Civic Engagement and Capacity to Engage in Policy and Decision-making***

|   |   |
|---|---|
| Citizenship   | Proportion of census tract residents who are U.S. citizens.   |
| Proportion of census tract residents who are U.S. citizens. | Proportion of tract residents who are eligible to vote        |
| Eligible voters   | Proportion of county residents who voted in a recent election |

## ***Residential Segregation and Income Inequality***

**Segregation:  
Generalized  
Dissimilarity Index  
(Evenness)**

The extent of racial/ethnic segregation within a county, region or metropolitan statistical area. This index measures the proportion of residents from each racial/ethnic group that would have to move to achieve an even distribution within an area.

**Income Inequality:  
Gini Coefficient**

Gini coefficient is a number between 0 and 1, where 0 means perfect equality (everyone has the same income) and 1 means perfect inequality (one person has all the income, everyone else has nothing).

# Research Objectives

- Is there a stronger association between air pollution exposures and adverse birth outcomes when vulnerability indicators are included in the analyses?
- What is the association between exposure to vehicle-related air pollutants, in terms of distance from roadway and traffic density, and adverse birth outcomes, and is there a stronger association when vulnerability indicators are included in the analyses?

# Vehicle Related Air Pollution

- South Coast Air Basin – high volume arterials and freeways will be geocoded
  - For each residential address, the distance between that address and the nearest high volume arterial or freeway will be determined, along with information on traffic density and vehicle fleet mix for that roadway.
- Rest of California, census tract analysis